

CLAIMS

1. An information recording apparatus, comprising:

a recording device for recording record information, by irradiating
5 laser light with a variable recording power, onto an information recording
medium comprising: a first recording layer into which the record information
is recorded; and a second recording layer into which the record information is
recorded through said first recording layer;

a calculating device for recording test information for test writing by
10 irradiating said second recording layer with the laser light through a
recording area in which the record information is unrecorded in said first
recording layer with said recording device, to thereby calculate an optimum
power of the laser light in recording the record information by irradiating said
second recording layer with the laser light through a recording area in which
15 the record information is already recorded in said first recording layer; and

a controlling device for controlling said recording device to irradiate
the laser light with the optimum power calculated by said calculating device,
in recording the record information into said second recording layer.

20 2. The information recording apparatus according to claim 1, wherein
said calculating device calculates the optimum power by correcting
correlation information which indicates a correlation between reproduction
quality of the test information and the recording power.

25 3. The information recording apparatus according to claim 2, wherein
said calculating device corrects the correlation information, on the basis of a

difference between a feature of the laser light irradiated through the recording area in which the record information is unrecorded in said first recording layer and a feature of the laser light irradiated through the recording area in which the record information is already recorded in said
5 first recording layer.

4. The information recording apparatus according to claim 2, wherein transmittance for the laser light is reduced in said first recording layer by recording the record information therein, and

10 said calculating device corrects the correlation information to make the calculated optimum power greater than an optimum power indicated by the correction information before the correction.

5. The information recording apparatus according to claim 2, wherein
15 transmittance for the laser light is increased in said first recording layer by recording the record information therein, and

said calculating device corrects the correlation information to make the calculated optimum power less than an optimum power indicated by the correction information before the correction.

20 6. The information recording apparatus according to claim 1, wherein said controlling device controls said recording device to irradiate the laser light having a predetermined waveform which is different from a waveform of the laser light for recording the test information.

25 7. The information recording apparatus according to claim 6, wherein

said calculating device controls said recording device to irradiate the laser light having the different predetermined waveform, on the basis of a difference between a feature of the laser light irradiated through the recording area in which the record information is unrecorded in said first recording layer and a feature of the laser light irradiated through the recording area in which the record information is already recorded in said first recording layer.

8. The information recording apparatus according to claim 6, wherein the waveform of the laser light includes a combination of a short pulse and a long pulse, and

said controlling device controls said recording device such that the short pulse in the predetermined waveform is longer or shorter on a time axis, as compare to the waveform of the laser light for recording the test information.

9. The information recording apparatus according to claim 8, wherein said controlling device controls said recording device to make the short pulse in the predetermined waveform longer or shorter than the waveform of the laser light for recording the test information, by a ratio equal to or greater than 5% and equal to or less than 10%.

10. An information recording method in an information recording apparatus, comprising: a recording device for recording record information, by irradiating laser light with a variable recording power, onto an information recording medium comprising: a first recording layer into which the record

information is recorded; and a second recording layer into which the record information is recorded through said first recording layer,

said information recording method comprising:

5 a calculating process of recording test information for test writing by irradiating said second recording layer with the laser light through a recording area in which the record information is unrecorded in said first recording layer with said recording device, to thereby calculate an optimum power of the laser light in recording the record information by irradiating said second recording layer with the laser light through a recording area in which
10 the record information is already recorded in said first recording layer; and

a controlling process of controlling said recording device to irradiate said second recording layer with the laser light, with the calculated optimum power and through the recording area in which the record information is already recorded in said first recording layer, in recording the record
15 information into said second recording layer.

11. A computer program of instructions for recording control and for tangibly embodying a program of instructions executable by a computer provided in the information recording apparatus according to claim 1, to
20 make the computer function as at least one of said recording device, said calculating device, and said controlling device.